COMMUNICATION SYSTEM CAPABLE OF REDUCING

COMMUNICATION LOAD

Background of the Invention

5 ## 1. Field of the Invention

The present invention relates to a communication system using a radio apparatus. More particularly, the present invention relates to a communication system that can reduce a communication load on an

10 information provider of various contents or data.

2. Description of the Related Art

Recently, various radio apparatuses such as a portable telephone are widely used not only for calls but also for various other communications. Such

15 communications include, for example, a download of data such as music data and the like from a predetermined home page by using the Internet, reception of mail, and upload of picture data, such as a photograph taken by a user, to a home page of a

20 dealer in order to produce a photograph album.

An example of such a communication system is the Japanese Laid Open Patent Application (JPA 2000-90039) that discloses "Music Distributing Method, Transmitting Apparatus And Method, And Reproducing

25 Apparatus And Method". In this communication system, a music server and a client are connected to the

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Internet.   The client prepares a public key and a

secret key based on an ID unique to the reproducing

apparatus.   The public key is sent to and registered

30   in a server, and the secret key is stored in the

reproducing apparatus.   The client requests the server

to distribute music data.   The encryption based on the

registered public key is performed on the music data

fetched from a music database (DB).   The encrypted

35   music data is sent to the client, and stored in the

reproducing apparatus.   At a time of a reproduction,

the music data is decoded and reproduced in accordance

with the secret key stored in the reproducing

apparatus.   The music data stored in the reproducing

40   apparatus is encrypted in accordance with the key

prepared on the basis of the ID unique to the

reproducing apparatus.   Thus, the other reproducing

apparatuses cannot reproduce the music data.   This

configuration enables a system for distributing music

45   data to sufficiently protect the copyright of the

music data to be distributed.

        Also, Japanese Laid Open Patent Application (JP-

A-Heisei, 10-150460) discloses "Radio Picture

Communication System".   In this radio picture

50   communication system, a video server opens various

picture information stored therein as a common file

onto a network.   A terminal station sends a title of

picture information, which it desires to receive, as

control information to a radio control station by

55 using a second radio communication path. The control

radio station sends the title of the picture

information included in the control information

received from the terminal station, to a radio picture

station, and then instructs to send this picture

60 information to the terminal station. In response to

this instruction, the radio picture station reads out

the picture information corresponding to the

instruction from the common file, and then sends the

picture information to the terminal station by using

65 the first radio communication path. Thus, the radio

picture terminal can conveniently receive high quality

picture information .

Moreover, Japanese Patent No. 2924865 discloses

"Voice Mail System". In this voice mail system, a

70 server and one or more terminals are connected through

a communication medium to each other. The serer

manages a memory for storing a plurality of voice mail

data as an identifiable file in a memory area assigned

for each terminal. The server is provided with

75 transmitting means and memory control means. The

transmitting means, when receiving a mail request

through the communication medium from the terminal,

reads out the voice mail data from the memory area of

the memory assigned to a terminal of its transmission

80   source, and transmits to the terminal of the

transmission source.   The memory control means, when

receiving a mail edition signal, insert or add the

voice mail data in the mail edition signal to a

position specified by the mail edition signal, in the

85   memory area of the memory assigned to the terminal of

the transmission source.   This configuration allows

for extremely effective communication in a

communication network characterized by high costs and

transmission speeds slower than that of a wire line,

90   because the same voice mail data is not transmitted

and received between the server and the same terminals

multiple times.

      Fig. 1 shows an example of the conventional

communication system disclosed in Japanese Laid Open

95   Patent Application (JPA 2000-90039), in which a

portable telephone is used as a radio apparatus.   In

this communication system, a portable telephone 101

wirelessly communicates with a base station 102.   The

base station 102 is connected to a portable telephone

100   network 103, and the portable telephone network 103 is

connected to the Internet 104.   A content server 105

for providing various contents is connected to the

Internet 104.   The portable telephone 101 can access

the desirable content from server 105 through the

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105 portable telephone network 103 and the Internet 104.

For the purpose of easy explanation, Fig. 1 shows one

portable telephone 101, one base station 102 and one

content server 105.

In this communication system, let us suppose

110 that the content server 105 is a server that

exclusively provides a service of downloading music

data. When a new song of a popular singer or the like

is sold or a hit song is produced, a large number of

portable telephones 101 access the content server 105

115 dedicated to the music downloading operation. The

content server 105 establishes a link to each of the

portable telephones 101 accessing the server, and

distributes the music data requested by each of them.

Thus, if the accesses are concentrated on the

120 particular content server 105, the data distribution

rate per hour for each portable telephone 101 from the

content server 105 becomes very small. As a result,

the time it takes for each portable telephone 101 to

download the music data becomes long. Hence, this

125 results in high communication costs.

Conventionally, the above problem is solved by

employing a structure of several servers alongside the

content server 105 in order to distribute the load.

Such structure causes the facility cost on the side of

130 the content server 105 to be increased. Such a

measure may be effective for a content server 105

having a high access frequency. However, if the

accesses are temporarily concentrated on a server, the

fact that the size of the facility depends on the

135 access peak creates a problem related to efficient use

of the communication system. Thus, the problem that

the downloading of data in the case of load

concentration requiring abnormally long time is still

not solved in many content servers.

140   As mentioned above, the music distribution has

been described as an example. However, there may be a

case that an overload is temporarily induced on the

server side when electronic mails are collectively

distributed to the side of the portable telephones, or

145 when personal information is distributed to the

portable telephones under a predetermined condition.

This results in a similar problem, induced even when

the uploading operations are temporarily concentrated.

150   **Summary of the Invention**

     Therefore, an object of the present invention is

to provide a communication system which can avoid an

overload condition even if accesses for communication

are temporarily concentrated on a particular apparatus

155 such as a server and the like.

     In order to attain the above-mentioned objective,

a communication system according to the first aspect

of the present invention includes a network, a

distribution center and a client terminal.

160   The distribution center is comprised of a

distribution server containing any number of first

folders to which files read from a content server

connected to said network, an actuation timing setting

section for setting actuation time to process the

165   files stored in the first folders, a file read section

for reading out the corresponding file at the arrival

of the actuation timing set by the actuation timing

setting section and a radio transmitter for wirelessly

transmitting the file read by the file read section.

170   The client terminal is composed of any number of

second folders which are correlated to at least a part

of the first folders in a one-to-one relationship, a

radio receiver for wirelessly receiving the file

transmitted by the radio transmitter and a storing

175   section for storing the file received by the radio

receiver in the second folder corresponding to the

first folder.

That is, in the first aspect of the present

invention, the distribution server and client terminal

180   have any number of folders in which at least parts

thereof are correlated to each other in the one-to-one

relationship.   The distribution server stores a file

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read from a content server in the first folder.   The

actuation timing setting section sets an actuation

185   timing to process the file stored in the first folder.

The file read section reads the corresponding file at

the arrival of the actuation timing set by the

actuation timing setting section.   The radio

transmitter wirelessly transmits the read file to the

190   client terminal.   In the client terminal, the radio

receiver receives the file transmitted by the radio

transmitter.   The received file is stored in the

second folder corresponding to the first folder.

Thus, for example, if the downloading of a

195   predetermined file is requested by more than one

client terminal, and a long time is required in order

for the transfer of the file to those client terminals,

the content server from which the downloading of the

file is requested stores the file in the first folder

200   of the distribution server.   Since the distribution

server has the folder correlated to the client

terminal, the distribution server can wirelessly

transmit the requested file, in a way that the loads

are dispersed by setting the actuation timings.

205   Such a configuration including a distribution

server as a mediator between the portable information

terminal and the content server, on which the accesses

from the clients are temporarily concentrated, allows

for spreading of the transfer load.   It is also

210   efficient to install a cache memory in the

distribution server.

In the first aspect of the present invention,

the actuation timing setting section may set a

periodic interval as the actuation timing.   If the

215   transfer of the file is not urgent, the processes on

the distribution server can be dispersed by properly

setting the periodic interval.

In the first aspect of the present invention,

the actuation timing setting section may be used to

220   set a time as the actuation time.   According to this

configuration, in a case of a file transfer that is

not urgent, nighttimecan be used to thereby lower a

communication fee and also attain the effecient usage

of the distribution server.

225   In the first aspect of the present invention,

the actuation timing setting section may be actuated

when a new file is stored in the first folder, and the

corresponding file stored in the first folder is

removed after the new file is transferred to the

230   second folder through the radio transmitter and the

radio receiver and is stored therein.

This exemplifies a case in which the

transmission is done at real time when the file is

stored.   As for the transfer of an urgent file, this

235   configuration also allows for an urgent distribution

of the file.   Of course, if the distribution server is

responsible for the distributions of the files from

the various servers and the like, the transfer timings

of the urgent files can be dispersed entirely and

240   temporally.   Thus, there is little fear that the loads

are concentrated within a particular time frame.

A communication system according to a second

aspect of the present invention is composed a network,

a distribution server which is connected to the

245   network and has a first folder, a mobile terminal

which is connected to the network and has a second

folder correlated with the first folder, and a

position detector which detects a current position of

the mobile terminal.   The distribution server includes

250   a file transmitting section that wirelessly transmits

a file stored in advance in the first folder to the

second folder when the position detector detects that

the current position of the mobile terminal is a

predetermined position.

255   According to this communication system, the

mechanism in which a necessary file is transferred

from the distribution server to the mobile terminal,

with positional information as a trigger, is effective

as an area guide and the like, such as a case when a

260   user of the mobile terminal visits an unfamiliar place.

In the second aspect of the present invention, the file transmitted by the file transmitting section is the file for storing information of a predetermined territory, and the mobile terminal has an information

265 display for displaying the information of the territory when receiving this file.

That is, the mobile terminal has the information display for displaying information, such as a display, a speaker or the like, and the file for storing the

270 information of the predetermined territory is sent and displayed by the display.

A communication system according to a third aspect of the present invention is composed of a network, a mobile terminal which has a first folder

275 and a first communication unit for carrying out a radio communication, a distribution server which is connected to the network and has a memory region correlated to the first folder and a second communication unit for carrying out a radio

280 communication and a file transferring unit which, when a file is stored in the memory region of the distribution server, transfers the file to a particular memory region which is connected through the network to the distribution server.

285 According to this communication system, if the uploading operations of the files from the mobile

terminals are concentrated on the predetermined

regions among the several particular memory regions,

the distribution server is placed between them.   Then,

290 the mobile terminal stores the file in the individual

memory region corresponding to each of the mobile

terminals within the distribution server.   Thus, the

concentration of the loads is avoided.   Hence, this

has a merit that the mobile terminal can transmit and

295 receive the file without directly recognizing the

location of the particular memory region.

Brief Description of the Drawings

Fig. 1 is a system configuration view showing an

300 example of a conventional communication system in

which a portable telephone is used as a radio unit;

Fig. 2 is a system configuration view showing a

schematic configuration of a communication system in a

first embodiment of the present invention;

305 Fig. 3 is a block diagram showing the main

configuration of a portable information terminal used

in the first embodiment;

Fig. 4 is a plan view of a display showing an

example of a menu screen when a user accesses a portal

310 site, in the first embodiment;

Fig. 5 is a plan view of a display showing an

example of a menu screen for music distribution when a

user selects a button "Music Distribution" in the

first embodiment;

315   Fig. 6 is a plan view of a display when a user

selects an item "Minimum Fee" in the first embodiment;

Fig. 7 is an explanation view showing an example

of a folder used in the first embodiment;

Fig. 8 is an explanation view showing a flow

320   processes among a music server, a distribution server

and a portable information terminal when the

distribution server transmits music data to the

portable information terminal, in the first

embodiment;

325   Fig. 9 is a plan view showing a portable

information terminal displaying a mail setting screen

of a distribution server for the purpose of setting

distribution of an electronic mail, in the first

embodiment;

330   Fig. 10 is a flowchart showing the process of a

distribution server accessing a mail server and

storing mail in a corresponding folder, in the first

embodiment;

Fig. 11 is a flowchart showing the flow of an

335   electronic mail distribution process in a distribution

server, in the first embodiment;

Fig. 12 is a flowchart showing the flow of a

typical process in a distribution server, in the first

embodiment;

340   Fig. 13 is a system configuration view showing a
schematic configuration of a communication system in a
second embodiment;

      Fig. 14 is a plan view of a display showing an
example of a setting menu of a territory guide service,
345 in the second embodiment; and

      Fig. 15 is a system configuration view showing a
schematic configuration of a communication system in a
third embodiment of the present invention.

350   **Description of the Preferred Embodiments**

      The present invention will be described below in
detail with reference to the following embodiments.
(First Embodiment)

      Fig. 2 shows the schematic configuration of a
355 communication system in a first embodiment of the
present invention. In this communication system, a
portable information terminal 201, represented by a
portable telephone or a portable computer having a
communication function, is connected through a radio
360 base station or a circuit device (not shown), such as
a modem (a modulation demodulation device), a router
and the like, to the Internet 204. A music server 205
for storing a content of music and a mail server 206
for storing mail are connected to the Internet 204, as

365   an example of a content server for providing various contents. Also, a distribution center 200 includes a distribution server 207 for distributing the data of the content servers 205, 206 and a predetermined content server 208 used for accumulating a home page

370   as a portal site. The content servers 205 and 206, and the predetermined content server 208 are also connected to the Internet 204. The distribution center 200 also contains a distribution data store memory 209 for transiently storing the data for

375   distribution and a radio unit 210 for wirelessly distributing the data to the portable information terminal 201. A private cable 211 connects the music server 205 and the distribution server 207 and a private cable 212 connects the mail server 206 and the

380   distribution server 207.

        Fig. 3 is a block diagram showing the main configuration of the portable information terminal used in the first embodiment. The portable information terminal 201 is composed of a CPU (Central

385   Processing Unit) 221, ROM 223, RAM 224, a display control circuit 225, a display 226, a transmission/reception circuit 227, an antenna 228, an operation control circuit 229, an operation unit 231, a voice circuit 232, a microphone 233, a speaker 234

390   and a bus 222.

The CPU 221 is connected through the bus 222, such as a data bus, an address bus, a control bus and the like, to respective sections within the portable information terminal. The ROM 223 is a read only

395 memory for storing a program to carry out various controls of the portable information terminal 201 and other fixed data. The RAM 224 is a memory for work. The RAM 224 constitutes a detachable memory medium. If a detachable memory medium having a relatively

400 large capacity is assembled in the portable information terminal 201, a large amount of downloaded music data and the like can be stored in the medium.

The display control circuit 225 is used to display visual data on the display 226, such as a

405 liquid crystal or the like, assembled in the portable information terminal 201. The transmission/reception circuit 227 is used when data is transmitted and received through an antenna 228. The operation control circuit 229 is used to input operation data

410 from the operation unit 231 having a plurality of button switches (not shown) and control turning those button switches on or off. The voice circuit 232 is used for controlling an input/output of a voice, and it is connected to the microphone 233 and the speaker

415 234.

It should be noted that the music server 205,

the mail server 206 and the content server 208 which

are shown in Fig. 2 have the configurations basically

equal to those of a typical computer. Thus, those

420 explanations are omitted. The distribution server 207

also has similar configuration. However, it is

structurally different in that it has the distribution

data store memory 209 and the radio unit 210

wirelessly and automatically connected to the portable

425 information terminal 201 in order to carry out a

communication.

<Downloading of Music Data>

At first, a case in which a user of the portable

information terminal 201 shown in Fig. 2 downloads

430 music data utilizing the above communication system is

described as an example. In this case, the user of

the portable information terminal 201 initially

accesses a predetermined portal site on the Internet

204.

435 Fig. 4 shows an example of a menu screen when

the user accesses the portal site. The menu screen

customized for each user of the portable information

terminal 201 is displayed on the display 226. In this

example, a news button 241 for selecting a news site,

440 a mail button 242 for setting mail distribution and a

music distribution button 243 for accessing a home

page to distribute music are placed on the screen.

In this case, it is supposed that the user of

the portable information terminal 201 selects the

445 music distribution button 243. When the music

distribution button 243 is selected, the CPU 221 (Fig.

3) controls the access to the music server 205 shown

in Fig. 2, in accordance with a URL (Uniform Resource

Locator) prepared in advance. Thereby, a menu screen

450 of its home page is displayed on the display 226.

Fig. 5 shows an example of a menu screen for a

music distribution when the user selects a button

"Music Distribution". The menu screen is designed

that a predetermined number of songs whose

455 distributions are desired are displayed on the display

226. So, the user selects a desirable song from the

displayed songs by using a radio button. If the

desirable song is not displayed, the user can select a

next button 251 or a previous button 252 to locate

460 other song names.

This menu screen allows the user to also select

a manner of distributing music. If the user selects

an item "Immediately", although a downloading fee is

comparatively expensive, the distribution is

465 immediately started. If the user selects an item

"Minimum Fee", instead of the comparatively cheap

downloading fee, the distribution is carried out in a

time band in which the downloading work is relatively

empty.   In the system shown in Fig. 2, although the
470   distribution server 207 has the radio unit 210, there
may be a case that another radio unit or another radio
facility is used to send the data to the portable
information terminal 201.   In the latter case, the
data may be sent through a line up to the radio unit
475   or the radio facility.   In such instances, the data
may be sent in a time frame in which the line is not
busy or in the nighttime when the usage fee of the
line is low, and thus, try to lower the communication
cost.   Thus, if the user selects the item "Minimum
480   Fee", it takes a period of a half day or a day for the
user to receive the distributed desirable music.

It should be noted that the fee system is not
limited to two options, but may also employ three or
more options, depending on the music server 205.   For
485   example, a fee system of three options such as
"Immediately", "Within Five Hours" and "Within One
Day" may be employed.   When the user of the portable
information terminal 201 selects music and a
distributing manner on the menu screen shown in Fig. 5
490   and then the data according to the selection is sent
to the music server 205, data to confirm the user is
sent from the music server 205 or the distribution
server 207 to the portable information terminal 201,
and a confirmation screen is displayed.   Since the

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495 distribution of music is usually for a fee, an input

of a password is required.   Thus, it is possible to

prevent others from illegally requesting the

downloading.

Fig. 6 shows an example of a user confirmation

500 display when the user selects the item "Minimum Fee".

When the user selects the item "Minimum Fee", the

music server 205 entrusts the distribution server 207

with the distribution of the music.   The distribution

server 207 determines a time at which the music may be

505 distributed at the lowest fee, and returns the time

back to the portable information terminal 201 as time

data for the expected distribution time, and it is

displayed on the display 226.

On the other hand, if the user of the portable

510 information terminal 201 selects the item

"Immediately" from the display content of Fig. 5, the

music server 205 sends information of this selection

to the distribution server 207 and instructs the

immediate execution of the distribution.   At this time,

515 the password is also requested for the sake of the

user confirmation.

The first embodiment employs the manner of

entrusting the distribution server 207 with all the

distributions.   However, it is not always limited to

520 this manner.   For example, only in the case of the

selection of the item "Immediately", the music server

205 can immediately execute the distribution by using

a route connected through the Internet without any

intervention of the distribution server 207.   It is

525   imagined that the number of people who select the item

"Immediately" is relatively low because of the fee.

Thus, even if the music server 205 performs the direct

distribution to those people, the occurrence of the

overload caused by the concentration of the

530   downloading operations is not easily induced.   On the

contrary, when the music server 205 entrusts the

distribution server 207 with the collective

distribution, it is possible to simplify the process

of the distribution, the process for charging the fee

535   and the process for solving the trouble associated

with the downloading operation and the like.

The portable information terminal 201 and the

distribution server 207 in the first embodiment have

the radio units, respectively.   So, they can be

540   automatically connected to each other, and the data

can be sent and received between them.   The portable

information terminal 201 and the distribution server

207 have a folder all or a part of which has the

identical directory structures, in order to manage the

545   operation of sending and receiving the data.

Fig. 7 shows an example of a list of folders

used in the first embodiment. The list contains

information to identify an attribute of a

communication condition of a registered file. Every

550 folder constitutes a directory. By default, this

information (hereafter, referred to as a communication

condition file) occupies a part of the folders

constituting the directory. Also, the list contains

information to identify the registered files every

555 folder constituting the directory. By default, this

information (hereafter referred to as an ID file)

occupies a part of the folders constituting the

directory.

A folder "A" and a folder "B" are designed such

560 that the portable information terminal 201 and the

distribution server 207 shown in Fig. 2 check a

content of the folder "A" and "B" for each hour

indicated by "Condition", and the names of the files

are "F_1" and "F_2". Here, a functional attribute

565 "Synchronization" implies that the portable

information terminal 201 and the distribution server

207 have folders with the same content. If the files

registered in the folders with the same name are

different between the portable information terminal

570 201 and the distribution server 207, the missing file

is copied to the Portable Information Terminal or the

distribution server through the radio communication

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between them.   Also, if a file is removed in either

one of them, the same file as the removed file is

575   removed from the other.   The first embodiment employs

a protocol involving a transmission confirmation

control so that the above-mentioned copy or removal

can be perfectly executed.

A folder "C" is designed so that an actuation

580   attribute is set to "Real Time", namely, when a file

is added or removed, it is added or removed from both

the Portable Information Terminal and the distribution

server.   Its file name is "F_3".   That is, if the

actuation attribute is "Real Time", , if, for example,

585   at the time the distribution server 207 adds a file, a

radio communication is immediately executed.   So, the

same file is added to the portable information

terminal 201.   If a file is removed from one side, the

same file is also removed from the other side.

590   In folder "D", the actuation attribute is

"Manual", and the function attribute is

"Synchronization".   Thus, the content of the

corresponding files in the Portable Information

Terminal and the distribution server are manually

595   synchronized.   The file name is "F_4".   In the case of

"Manual" actuation attribute, a metaphor is equipped

to report to the user the presence of target

information.   The target information is synchronized

by using an ID file which can be identified by a file

600 registered in a folder assigned to it. The user, when

needing a body of the file, specifies the metaphor and

carries out a communication actuation.

In folder "E", the function attribute is

"Transfer". An actuation time for a transfer is set

605 at "3:25" as a "Condition". The file name is "F_5".

In the case of "Transfer", there is a directionality

of a communication. That is, if a file registered in

this folder is not present on a partner side between

the portable information terminal 201 and the

610 distribution server 207, its file is transmitted via a

radio communication to the partner side. When the

transmission is completed, the file of the

transmission source is erased.

It should be noted that "Period", "Real (Real

615 Time)", "Manual" and "Time Specification" as actuation

attributes in the list of the folders shown in Fig. 7

are merely examples. For example, "position" can be

used as actuation attribute. This will be explained

later. So, when the portable information terminal 201

620 enters into a particular position (area), it is

actuated. Then, a particular file is copied,

transferred or removed.

Fig. 8 flow chart of a process among the music

server, the distribution server and the portable

625 information terminal when the distribution server

transmits music data to the portable information

terminal.   When the music distribution button 243 is

pushed at the portal site shown in Fig. 4, the

portable information terminal 201 specifies a URL of

630 the music server 205 shown in Fig. 2 (Step S301).   If

there is an access through the Internet 204, the music

server 205 transmits data through the Internet 204 to

the portable information terminal 201 (Step S302) to

indicate an order entry screen as the one shown in Fig.

635 5.   In response to the transmission (Step S303),the

portable information terminal 201 specifies a

selection of a song and a distribution manner.   Upon

receiving this specification, the music server 205

invokes an external program from an HTML program by

640 using a CGI (Common Gateway Interface) and transmits

an instruction to switch the URL to the distribution

server 207 (Fig. 2) and a reception number to the

portable information terminal 201 (Step S304).   After

that, the portable information terminal 201 sends and

645 receives the data to and from the distribution server

207.   Specifically, the portable information terminal

201 sends the received URL of the distribution server

207, the reception number and a song name targeted for

the downloading operation to the distribution server

650 207 (Step S305).   It should be noted that, which

- 25 -

server is used as the distribution server 207 by the

music server 205 is determined in advance between the

two of them.

The distribution server 207, when receiving the

655 reception number, sends a password request screen

shown in Fig. 6, in order to confirm the user using

the portable information terminal 201 (Step S306).

The password inputted by the user is transferred to

the distribution server 207 (Step S307). If the

660 inputted password is correct, the distribution server

207 specifies the URL of the music server 205. If the

reception number and the song name to download the

music data and its song data are stored in a cache

memory formed in the distribution data store memory

665 209, the existing version is sent to the music server

205 (Step S308). If the requested music data stored

in the distribution data store memory 209 is reported

in response to the received reception number, the

music server 205 compares its version with a version

670 of music data stored in the self-server. Then, if the

versions are identical, the music server sends a

message to the distribution server 207 indicating that

the music data does not need to be sent. If the

versions are different from each other, or if the

675 requested music data is not present on the

distribution server 207, the music server sends the

music data to the distribution server 207 (Step S309).

If the music data is sent from the music server

205, the distribution server 207 stores it in the

680 distribution data store memory 209 in order to fulfill

the downloading request, and also in folder E shown in

Fig. 7 (Step S310). In this case, if music data of

the latest version is sent since the version in the

distribution data store memory is different, the

685 distribution server 207 overwrites the music data of

the latest version on the music data of the old

version stored in the distribution data store memory

209, and updates the management number of the version

to the newest number. If a message indicating that a

690 transmission is not required since the music data of

the latest version is stored in the distribution data

store memory 209 is sent from the music server 205,

the distribution server 207 reads out the

corresponding music data from the distribution data

695 store memory 209, and stores it in folder E (Step

S310).

The distribution server 207, which stores the

music data in folder E, sets a distribution time (Step

S311). If the item "Immediately" is specified on the

700 portable information terminal 201, the time of the

specification or a time slightly removed from it is

specified as the actuation attribute. On the other

hand, if the item "Minimum Fee" is selected, when the process on the distribution server 207 uses an empty

705 line, the time set at Fig. 6 as the time band at which the communication fee is low is specified as a specification time. After that, the distribution server 207 checks whether or not the specification time has arrived, on the basis of a predetermined

710 periodic interval (Step S312). When the specification time arrives (YES), the distribution server 207 distributes the corresponding music data to the portable information terminal 201 (Step S313).

It should be noted that, in the case of

715 distributing the music data to the portable information terminal 201, an identification number is required in order to specify the portable information terminal 201. This identification number may be registered on the portal site customized for the user,

720 as in Fig. 4, or may be registered when an access to the home page of the music server 205 shown in Fig. 5 is obtained. The first embodiment is explained under the assumption that the distribution server 207 has the unique radio unit 210. However, when the portable

725 information terminal 201 is a portable telephone, the music data can be distributed by using a neighboring base station as the radio unit 210. In this case, the distribution server 207 may distribute the music data

by using the telephone number of the portable

730   information terminal 201. Also, if the telephone

number is sent to the music server 205 or the

distribution server 207 from the portable information

terminal 201 together with the data of the reception

number and the like and stored correspondingly to the

735   reception number, it can be used in distributing the

music data.

<Distribution of Mail>

An example of a distribution server 207

distributing mail received by the mail server 206

740   shown in Fig. 2 will be described below. Let us

suppose that the mail server 206 has a function as a

POP (Post Office Protocol) server for receiving and

holding mail from a portable information terminal 201.

If it is assumed that the mail server 206receives one

745   mail destined to a user of a portable information

terminal 201, sends it to the corresponding portable

information terminal 201, there may be many cases when

a time longer than the communication time of the

content of the mail is spent on a procedure necessary

750   for establishing connection to the portable

information terminal 201. Thus, this is not cost-

efficient. Also, if the user has a plurality of mail

addresses, the economic efficiency is lowered since

the respective mail servers 206 send the independently

755 received mails to the portable information terminal

201. So, in the first embodiment, the distribution

server 207 collectively manages and distributes the

mails from the users of the portable information

terminals 201 to thereby lower the communication cost.

760   Fig. 9 shows the condition when a portable

information terminal displays a mail setting screen of

a distribution server, used to set the distribution of

mail. In order to display the mail setting screen

shown in Fig. 9, as described in the above-mentioned

765 example, it is enough to access the portal site sown

in Fig. 4, display its menu screen, and then push the

mail button 242. Thus, it is possible to access the

distribution server 207 and then display its mail

setting screen. Of course, the mail setting screen

770 can be displayed by directly inputting the URL of the

distribution server 207 and using a predetermined

procedure.

    On the mail setting screen displayed on display

226, the user can set "Mail Server Patrol Time",

775 "Usual Communication Time Interval" and "Emergent

Communication Filter". "Mail Server Patrol Time"

specifies a time interval in which the distribution

server 207 patrols the respective mail servers 206 in

relation to the mail addresses of the user. If this

780 interval is long, it is difficult to cope with an

urgent mail. "Usual Communication Time Interval"

implies a time interval, in which when mails are

received and obtained by any of the mail servers 206,

they are collectively sent to the portable information

785   terminal 201 by radio. "Emergent Communication

Filter" implies a filter to immediately distribute

mail received from an address used to identify an

urgent communication.

      Fig. 10 shows the flow of the process that

790   enables the control of the above-mentioned

distribution server. For each arrival of a patrol

time (Step S331: YES), the distribution server 207

accesses a predetermined mail server 206 (Step S332).

If mail has been received (Step S333: YES), it is

795   fetched, and it is judged whether or not a

transmission source agrees with a mail address set as

"Emergent Communication Filter" (Step S334). If it

agrees (YES), this mail is stored in folder C (real

time actuation) shown in Fig. 7 (Step S335). The mail

800   received from the other transmission source is not

urgent. Thus, such mail is stored in folder B (for

each hour) (Step S336).

      If the above-mentioned division is carried out,

mail server 206 (Step S337 looks whether or not

805   another mail is received. If it is found that other

mail is received (YES), steps S334-S337 are performed.

If all the mail is processed in the above-mentioned manner (Step S337: NO), the process is returned back to the original state (Return). In a case that the

810 mail is not received at step S333, a similar process is carried out.

It should be noted that the above-mentioned process uses the emergent communication filter and determines the distribution interval between the mail

815 deliveries. However, depending on the electronic mails, the degrees of urgency can be set, one by one. With regard to such mail, the degree of urgency is checked at a processing step corresponding to step S334. The mail having high urgency may be stored in

820 folder C, and other mail may be stored in folder B.

Fig. 11 shows the flow in the distributing process of the electronic mail in the distribution server. The distribution server 207 checks folder C for the presence or absence of a mail file to be sent

825 in (Step S351). In case there is a mail file (YES), its mail content is immediately sent to a user of a portable information terminal 201 by radio (Step S352). If there is no mail in folder C to be sent, it is checked whether or not a certain period (here, one

830 hour) has elapsed (Step S353). If it has not elapsed (NO), the operational flow returns back to step S351 and enters a wait state.

If it is judged at step S353 that a certain

period has elapsed (YES), a presence or absence of a

835   mail file to be sent to folder B is checked (Step

S354).   If there is no mail file (NO), the period is

reset (Step S355), and the operational flow again

returns back to the process of step S351 (Return).   If

a mail file to be sent to folder B is present at step

840   S354 (YES), the mail file is sent to a user of a

portable information terminal 201 by radio (Step S356).

After that, the operational flow proceeds to step S355,

and the period is reset.

        It should be noted that, Fig. 11 illustrates the

845   distributions with regard to folders B, C.   However,

if the distribution server 207 is responsible for the

distribution of the electronic mail as well as the

other various data such as music data and the like, it

is possible to distribute them in an integrated manner.

850   In this chase, while the various folders shown in Fig.

7 are checked, the corresponding file is sent

automatically or manually.

        Fig. 12 shows the flow of a typical process of

the distribution server.   If the patrol time has

855   arrived (Step S371: YES), the distribution server 207

confirms the actuation attribute illustrated in Fig. 7

(Step S372).   If the file is present in folder C (Step

S373: YES), the distribution server 207 distributes

- 33 -

the file (Step S374). Next, it is checked whether or

860 not the time specified for folder E has arrived (Step

S375). In a case of the specified time is arrived

(YES), the file stored in the folder E is distributed

(Step S376). Next, it is checked whether or not a

predetermined time (for example, one hour) elapses

865 from a previous distribution time with regard to the

folders A, B (Step S377). If it elapses (YES), the

files present in the folders A, B are distributed

(Step S378).

It should be noted that it is not always

870 necessary to independently carry out the distribution

for each folder. The respective files may be copied

to a buffer region, and the files targeted for the

distribution may be collectively targeted for the

transmission, in accordance with a series of

875 procedures. Thus, for example, the electronic mail

and the music data are collectively distributed at the

same time. Hence, it is possible to drop the cost

necessary for the distribution.

(Second Embodiment)

880 Fig. 13 shows the schematic configuration of a

communication system in a second embodiment of the

present invention. The communication system is

composed of a portable telephone network 401, base

stations 403_1 to 403_N responsible for respective service

885   areas 402_1 to 402_N, an information distribution center

404, and a position detection center 405 that are

connected to the portable telephone network 401.   In

this communication system, when a portable telephone

406 serving as a portable information terminal enters

890   into a predetermined particular service area 402, the

position detection center 405 detects it.   Then, in

accordance with an actuation attribute "Position" that

is not included in the actuation attributes shown in

Fig. 7 of the first embodiment, data for the service

895   area 402 is sent to the portable telephone 406.   So, a

territory guide service is carried out by using a

voice or a picture.   It should be noted that, it may

be designed that the position detection center 405

detects a position, on the basis of a base station

900   that manages the portable telephone 406 or detects the

position by using another position detector such as

GPS (Global Positioning System).

        Fig. 14 shows an example of a setting menu of a

territory guide service displayed on a display of a

905   portable telephone, in the second embodiment.   A user

of the portable telephone 406 shown in Fig. 13 carries

out a predetermined operation to display this setting

menu on a display 411.   This menu is designed so that

a "Corresponding Territory (service area)" targeted

910   for a guide and a "Guide Content" can be selected by

using a radio button.   For example, let us suppose

that the user of the portable telephone 406 indicates

Sinjuku as "Corresponding Territory" and indicates a

restaurant as "Guide Content".   Then, when the

915   portable telephone 406 of the user enters into the

service area 402_N of Sinjuku, the position detection

center 405 sends position information together with an

ID of the portable telephone 406 to the information

distribution center 404.   The information distribution

920   center 404 has a table as shown in Fig. 7 of the first

embodiment.   So, it wirelessly transmits data with

regard to the restaurants in Sinjuku to the

corresponding portable telephone 406.   The function

attribute in this example may be "Synchronization".

925   The user of the portable telephone 406 can

receive similar services in a plurality of territories

(service areas).   Thus, if the user indicates two

territories (for example, Sinjuku and Tokyo) in

advance, when the portable telephone 406 enters into a

930   service area 402_1 of Tokyo, the user can receive guide

of desirable shops, such as restaurants, bookstores

and the like, and tourist spots and the like near

Tokyo Station.

(Third Embodiment)

935   Fig. 15 shows a schematic configuration of a

communication system in a third embodiment of the

present invention.   This communication system is

configured so that portable telephones 501_1 to 501_N of

respective persons have respective dedicated memory

940   regions 504_1 to 504_N in a distribution server 503 on the

Internet 502.   That is, the first portable telephone

501_1 has a dedicated first memory region 504_1 in the

distribution server 503.   Similarly, the N-th portable

telephone 501_N has a dedicated N-th memory region 504_N

945   in the distribution server 503.   On the Internet 502,

for example, there is a camera shop server 506 managed

by a camera show or a card print server 507 managed by

a card print shop.

Let us suppose that an owner of the first

950   portable telephone 501_1 holds data to make a card in a

memory medium 511 and this data is uploaded to the

card print server 507.   In this case, the owner of the

first portable telephone 501_1 wirelessly uploads it to

the first memory region 504_1 dedicated to the owner in

955   the distribution server 503, while "Data For Making

Card", "Transfer" Data and "Distribution Time" are

clearly written.   Similarly, let us suppose that an

owner of the N-th portable telephone 501_N wants a

large-sized print of a picture photographed by a

960   digital camera 512.   So, an output terminal of the

digital camera 512 is connected to the N-th portable

telephone 501_N, and its picture data is wirelessly

updated to the N-th memory region 504_N dedicated to the

owner in the distribution server 503 while "Data For

965 Camera Shop", "Transfer" data and "Distribution Time"

are clearly written.   A plurality of data can be

stored in the respective dedicated memory regions 504_1

to 504_N, such as "Data For Making Card" and "Data For

Camera Shop".

970   The distribution server 503 periodically scans

the memory regions 504_1 to 504_N.   If "Transfer" data is

stored in any of those regions, "Distribution Time" is

read out as a condition and a destination of the data

to then distribute to a corresponding server at an

975 indicated time.   In a case of "Data For Making Card"

stored in the first memory region 504_1, for example,

this is distributed to the indicated card print server

507 at the indicated time.   Also, in a case of "Data

For Camera Shop", this is distributed to the indicated

980 camera shop server 506 at the indicated time.

    As mentioned above, in the third embodiment of

the present invention, since the distribution server

503 is installed, it is not required that a plurality

of card print servers 507 themselves are placed, even

985 if there is a time frame in which accesses are

concentrated on the card print server 507.   Moreover,

the respective servers, such as the camera shop server

506 and the card print server 507, can commonly use

the distribution server 503.   Thus, it is possible to

990   attain a very effective communication system.   Of

course, the dedicated memory regions 504_1 to 504_N are

not always used only for "Transfer" data.   The

function attribute may be set to "Synchronization".

For example, when the distribution server 503 obtains

995   data from a certain server and inserts it into the

first memory region 504_1, the data may be automatically

sent out to the first portable telephone 501_1.   Even

in this case, it is naturally possible to select a

time frame for distribution and cheaply send data.

1000   As mentioned above, according to the first

aspect of the present invention, the distribution

server and client terminal have any number of folders

in which at least parts thereof correspond to each

other, and the distribution server stores a file read

1005   from a content server in the first folder.   For

example, if the downloading of a predetermined file is

requested by a number of client terminals, and a long

time is required in order to transfer the file to

those client terminals, the content server to which

1010   the file is requested stores the file in the first

folder of the distribution server.   Then, the

actuation time can be suitably set to thereby disperse

the loads in the entire communication system.

Moreover, the file is wirelessly communicated between

1015   the distribution server and client terminals. Thus,

it is also possible to reduce the load on the

telephone line.

Also, according to the first aspect of the

present invention, the loads can be dispersed without

1020   any increase of the facility, by using the

distribution server for the transfer of the file in

the content server or the like, on which the accesses

from the client terminals are temporarily concentrated.

Moreover, according to the first aspect of the

1025   present invention, the periodical actuation is carried

out as one manner of the actuation of the actuation

timing setting section. Thus, the processes

themselves on the distribution server can be dispersed

by properly setting the periodic interval if the

1030   transfer of the file is not urgent.

According to the first aspect of the present

invention, the actuation timing setting section sets

the time when the actuation is carried out. So, the

technique for using the nighttime in the case of file

1035   transfer having no emergency can be used to thereby

lower the communication fee and also attain the

effective usage of the distribution server.

According to the first aspect of the present

invention, the actuation timing setting section is

1040   actuated when the new file is stored in the first

folder.   Thus, as for the transfer of the urgent file,

this enables its request to be executed.   Of course,

if the distribution server is responsible for the

distributions of the files from the various servers

1045   and the like, the timings of the transfers of the

urgent files can be dispersed entirely and temporally.

Hence, there is little fear that the loads are

concentrated in one particular time.

Also, according to the second aspect of the

1050   present invention, the position is used as the factor

of file transfer.   Thus, the necessary information

with the position information as the trigger can be

sent to the movable apparatus such as the portable

telephone and the like.   Hence, this is effective for

1055   the guide of position and the like.

Moreover, according to the third aspect of the

present invention, if the uploading operations of the

files from the mobile terminals are concentrated on

the predetermined regions among the several particular

1060   memory regions, the distribution server is placed

between them.   Then, the mobile terminals store the

file in the individual memory region corresponding to

each of the mobile terminals within the distribution

server.   Thus, the concentration of the loads can be

1065   avoided.   Hence, this has the merit that the mobile

terminal can transmit and receive the file without

directly recognizing the location of the particular

memory region.